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Government Expenditure on Security and Private Investment in Nigeria

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Abstract- ***This study examines the relationship between government expenditure on security and private investment in Nigeria over the period 2000-2024, incorporating inflation and interest rates as additional explanatory variables. Grounded in public goods theory, the study hypothesizes that effective security provision creates an enabling environment for private investment by protecting property rights, reducing transaction costs, and lowering risk premiums demanded by investors. The Dynamic Ordinary Least Squares (DOLS) methodology was employed to estimate long-run cointegrating relationships among the variables, addressing potential endogeneity and serial correlation problems inherent in standard estimation techniques. The findings reveal a positive and statistically significant relationship between government expenditure on security and private investment, indicating that a 1% increase in security expenditure is associated with approximately 1.02% increase in private investment. Conversely, inflation exhibited a negative and statistically significant effect on private investment, confirming that macroeconomic instability deters capital formation by creating uncertainty about future returns. Interest rates similarly demonstrated a negative insignificant relationship with private investment, consistent with neoclassical investment theory predictions that elevated borrowing costs reduce investment viability. The study concludes that security provision and macroeconomic stability function as complements in promoting private investment, with neither alone sufficient for optimal outcomes. Policy recommendations include maintaining effective security expenditure, prioritizing inflation control through credible monetary policies, reducing interest rates via financial sector development, and adopting coordinated policy approaches that recognize the interdependence of security reforms and macroeconomic management in stimulating private sector capital formation.***

Keywords: Government expenditure on security, private investment, public goods theory, inflation, interest rates, DOLS, Nigeria

I. INTRODUCTION

1.1 Background to the Study

Nigeria, Africa's most populous nation and largest economy, has faced persistent security challenges since the return to democratic rule in 1999. These challenges include the Boko Haram insurgency in the North-East, farmer-herder conflicts in the Middle Belt, banditry and kidnapping in the North-West, separatist agitations in the South-East, and militancy and oil-related violence in the Niger Delta (Amnesty International, 2023; International Crisis Group, 2024). The escalation of insecurity has not only resulted in significant loss of lives and displacement of populations but has also imposed substantial economic costs on the country (World Bank, 2022).

In response to these threats, successive Nigerian governments have significantly increased budgetary allocations to the security sector. For instance, defence and security spending rose from ₦921 billion in 2015 to over ₦2.4 trillion in 2023, representing an average of approximately 15–20% of the annual federal budget during this period (Budget Office of the Federation, 2023). The government has justified this increase as necessary for equipping the armed forces, intelligence gathering, and internal security operations (Federal Republic of Nigeria, 2022). Proponents of high security expenditure argue that improved security is a public good that creates an enabling environment for economic activities, including private investment (Blomberg & Hess, 2006; Alesina & Perotti, 1996).

However, the relationship between government security expenditure and private investment remains theoretically and empirically ambiguous, particularly in developing economies. On one hand, higher security spending can have a crowding-in effect by reducing risk perception among investors, protecting property rights, and stabilizing the business

environment, thereby encouraging private capital inflows (Aisen & Veiga, 2013; Fielding, 2003). On the other hand, excessive allocation to non-developmental security votes may produce a crowding-out effect by reducing resources available for critical infrastructure (roads, electricity, education, and health), which are essential complementary inputs for private investment (Aschauer, 1989; Barro, 1991). In Nigeria, the opportunity cost of high security spending is particularly pronounced given the country's huge infrastructure deficit and perennial underfunding of productive sectors (African Development Bank, 2023).

The pervasive insecurity has created an atmosphere of uncertainty that affects business confidence and investment decisions. These multifaceted security threats have necessitated increased government expenditure on defense and internal security operations, with security spending constituting a substantial portion of Nigeria's annual budget. According to Abadie and Gardeazabal (2003), countries experiencing high levels of violence and insecurity typically witness capital flight, reduced foreign direct investment, and declining domestic private investment. In Nigeria's context, reports indicate that investors increasingly factor security risks into their investment calculus, with some multinational corporations relocating operations or scaling down activities in high-risk zones (Okechukwu, Mbah, & Nwankwo, 2017).

1.2 Statement of the Problem

Despite large and rising budgetary allocations to security and defence in recent years, private investment in Nigeria has shown weak and volatile growth, raising concerns that public spending on security may be crowding out or distorting private-sector capital formation. For example, government allocations to the security and defence sector have grown markedly in the 2020s even as private gross fixed capital formation (a common proxy for private investment) has failed to recover to stable pre-crisis levels (BudgIT, 2024).

At the same time, Nigeria has experienced persistent macroeconomic instability especially high inflation and elevated policy interest rates since 2022–2024 which can raise the cost of capital and reduce firms' incentives to invest. Because inflation and interest rates both influence investment decisions, any assessment of the impact of security expenditure on private investment must control for these macroeconomic factors to avoid biased inference (CBN, 2024).

The core research problem, therefore, is to determine whether and to what extent government expenditure on security (measured in recurrent and/or capital outlays) affects private investment in Nigeria over the period 2000–2024, after accounting for inflation and interest-rate effects. Empirically disentangling these relationships is important because security spending may have ambiguous effects: it can either deter private investment by crowding out public resources and raising uncertainty, or it can stimulate investment by improving stability and protecting property rights. Existing Nigeria studies provide mixed results on security spending's growth effects and rarely focus specifically on private investment while jointly controlling for inflation and interest rates over the full 2000–2024 window thereby leaving a clear gap this study will address.

1.3 Research Objectives

The main objective of the study is to examine the impact of government expenditure on security on private investment in Nigeria from 2000 to 2024. The specific objectives are to:

1. Determine the effect of government expenditure on security on private investment in Nigeria.

2. Assess how inflation influences private investment in Nigeria.

3. Examine the effect of interest rates on private investment in Nigeria.

1.4 Research Questions

1. What is the effect of government expenditure on security on private investment in Nigeria?

2. How does inflation affect private investment in Nigeria during the study period?

3. What impact do interest rates have on private investment in Nigeria?

1.5 Research Hypotheses (Null Form)

$H0_1$: Government expenditure on security has no significant effect on private investment in Nigeria.

$H0_2$: Inflation has no significant effect on private investment in Nigeria.

$H0_3$: Interest rates have no significant effect on private investment in Nigeria.

1.6 Significance of the Study

This study is significant because it provides empirical evidence on how government expenditure on security influences private investment in Nigeria, a relationship that is crucial for understanding the country's investment climate and long-term growth prospects. Given Nigeria's rising security challenges and expanding security budgets since the early 2000s, the study helps clarify whether such spending enhances investor confidence or constrains private-sector investment by diverting resources and creating macroeconomic instability. By controlling for inflation and interest rates - two major determinants of investment - the study offers a more accurate assessment of the factors shaping private investment behaviour. The findings will be valuable to policymakers, investors, development partners, and researchers seeking to design security, fiscal, and monetary policies that balance national stability with sustainable private-sector development.

1.7 Scope of the Study

The study covers the period 2000 to 2024 and focuses on examining the impact of government expenditure on security, inflation, and interest rates on private investment in Nigeria. It is limited to macroeconomic-level data sourced from national and international statistical agencies such as the Central Bank of Nigeria (CBN), the National Bureau of Statistics (NBS), and the World Bank. The analysis centres on private investment as the dependent variable, while government expenditure on security, inflation, and interest rates serve as explanatory variables within a time-series econometric framework. The geographical scope is restricted to Nigeria, and the study emphasizes long-term trends, statistical relationships, and policy relevance rather than micro-level or sector-specific effects. The selected time frame is determined by the availability and consistency of data from relevant government institutions, including the Central Bank of Nigeria (CBN), National Bureau of Statistics (NBS), and Federal Ministry of Finance, which ensured a reliable dataset for empirical analysis.

II. LITERATURE REVIEW

2.1 Conceptual Framework

2.1.1 Private Investment

Private investment refers to capital expenditures made by private sector entities, including individuals, corporations, and non-governmental organizations, for the acquisition of physical assets, equipment, structures, and other productive resources intended to generate future income streams (Frimpong & Marbuah, 2010). Private investment plays a crucial role in economic development by creating employment opportunities, facilitating technology transfer, enhancing productivity, and contributing to gross domestic product growth (Anyanwu, 2012; Kanu & Ozurumba, 2014). In developing economies like Nigeria, private investment is particularly vital because government resources alone are insufficient to meet the massive infrastructure and development needs (Adegboye, Alimi, & Olopade, 2020). The quality and quantity of private investment determine the pace of industrialization, sectoral diversification, and overall economic transformation (Asiedu, 2023).

2.1.2 Government Expenditure on Security

Government expenditure on security encompasses all public spending directed toward maintaining internal and external security, protecting citizens and property, and ensuring the territorial integrity of the state (Dunne & Tian, 2023). According to Omitoogun and Hutchful (2006), security expenditure includes allocations to military forces, police and paramilitary organizations, intelligence services, correctional facilities, civil defense agencies, and border control operations. In the Nigerian context, security expenditure also includes funding for counter-insurgency operations, peacekeeping contributions, security equipment procurement, and personnel emoluments for security agencies (Yusuf & Akanbi, 2016). The conceptualization of security expenditure

extends beyond mere military spending to encompass broader public safety and order functions. Collier and Hoeffler (2004) argue that security provision represents a fundamental public good characterized by non-excludability and non-rivalry in consumption, meaning that once provided, all citizens benefit regardless of their individual contributions. In sub-Saharan Africa specifically, military and security spending averaged approximately 1.5-2.5% of GDP between 2000 and 2020, though individual country allocations varied substantially based on specific security threats and political considerations (Stockholm International Peace Research Institute, 2021).

2.1.3 Inflation

Inflation is defined as a sustained increase in the general price level of goods and services in an economy over time, resulting in a decline in the purchasing power of money (Fischer, 1993; Gokal & Hanif, 2004). Central banks and statistical agencies typically measure inflation using consumer price indices (CPI), producer price indices (PPI), or GDP deflators, with CPI being the most commonly employed measure for policy purposes. In Nigeria's context, inflation has historically been influenced by multiple factors including monetary expansion, fiscal deficits, exchange rate depreciation, supply shocks from agricultural production variations, and structural bottlenecks in distribution systems (Bawa, Abdullahi, & Ibrahim, 2016; Udoka & Ehrlich, 2020). The inflationary environment affects different sectors and regions of Nigeria unevenly. Nwosa (2021) notes that food inflation typically exceeds core inflation due to agricultural production challenges, poor transportation infrastructure, and supply chain disruptions from insecurity. This sectoral variation means that investors in different industries face distinct inflation-related risks, with implications for overall private investment patterns.

2.1.4 Interest Rates

Interest rates represent the cost of borrowing money or the return on lending money, expressed as a percentage of the principal amount over a specified period (Mishkin, 2017). In economic analysis, interest rates serve multiple functions: they allocate capital between borrowers and lenders, reflect the opportunity cost of current versus future consumption, and transmit monetary policy to the real economy (Taylor, 1995). Nigeria's interest rate structure has been characterized by persistently high levels and significant volatility throughout the study period. Obadeyi (2024) documents that Nigerian commercial lending rates have typically remained in double digits, ranging from 15% to over 25% between 2000 and 2020, substantially exceeding rates in comparable emerging economies. These elevated rates reflect multiple factors including high inflation, significant credit risk in the banking sector, inefficient financial intermediation, and Central Bank of Nigeria monetary policy stances aimed at exchange rate stability and inflation control

2.1.5 Linking the Concepts

The relationship between government expenditure on security and private investment can be understood through the framework of crowding-out and crowding-in effects. The crowding-out hypothesis, articulated by Barro (1989), posits that increased government spending financed through borrowing reduces loanable funds available to private investors, raises interest rates, and thereby displaces private investment. In this view, government security expenditure competes directly with private investment for scarce financial resources, with the net effect being reduced private capital formation (Aschauer, 1989). Conversely, the crowding-in hypothesis suggests that government expenditure can complement and stimulate private investment under certain conditions. When government security expenditure effectively reduces insecurity and creates a stable environment, it lowers investment risk premiums, protects property rights, and reduces transaction costs, thereby encouraging private investment (Aschauer, 1989; Devarajan, Swaroop, & Zou, 1996). This complementarity effect proves particularly relevant when security provision addresses binding constraints on private sector activity, such as protection from theft, kidnapping risks, or contract enforcement failures. Inflation and interest rates jointly influence the macroeconomic stability environment within which private investment decisions occur. The literature emphasizes that macroeconomic instability, characterized by high inflation and volatile interest rates, creates uncertainty that discourages long-term

investment commitments (Igwemma, 2024; Ikwumezie, 2022). Real interest rates (nominal rates adjusted for inflation) should determine investment decisions, as they reflect true borrowing costs in terms of purchasing power (Fisher, 1930). The policy responses to inflation through interest rate adjustments create additional dynamics affecting investment. When central banks raise interest rates to combat inflation, they simultaneously increase borrowing costs for private investors and may trigger exchange rate appreciation that affects competitiveness of export-oriented investments (Igwemma, 2024).

2.2 Theoretical Literature

2.2.1 Public Goods Theory

Public goods theory, originating from Samuelson's (1954) seminal work, provides the foundational framework for understanding government's role in security provision and its implications for private investment. The theory defines public goods as commodities characterized by two essential properties: non-excludability, meaning no individual can be prevented from consuming the good once provided, and non-rivalry, meaning one person's consumption does not diminish availability for others (Cornes & Sandler, 1996). Security provision represents a canonical example of a public good because when government protects citizens and property from threats, all individuals within the protected territory benefit regardless of their contributions to financing, and one person's enjoyment of security does not reduce security available to others (Collier & Hoeffler, 2004; Sandler & Hartley, 1995). These characteristics create market failures whereby private markets systematically under-provide security due to free-rider problems, justifying government intervention to ensure adequate provision (Olson, 1965). From an investment perspective, public goods theory predicts that effective security provision creates an enabling environment for private investment by protecting property rights, enabling contract enforcement, reducing transaction costs, and lowering risk premiums that investors require for committing capital to long-term projects (North, 1990; Besley & Persson, 2011; Acemoglu & Robinson, 2012). Nigeria has experienced multifaceted security threats including Boko Haram insurgency, banditry, kidnapping, and communal conflicts that have directly deterred private investment through increased operational risks, asset destruction, and heightened uncertainty (Onuoha, 2014; Ewetan & Urhie, 2014; Okechukwu, Mbah, & Nwankwo, 2017). While public goods theory suggests that government security expenditure should complement private investment by addressing these binding security constraints, Nigeria's experience reveals a significant gap between nominal security expenditure and actual security provision attributable to corruption, inefficiency, and misallocation within the security sector (Ogundiya, 2009; Achumba, Ighomereho, & Akor, 2013). Furthermore, deficit financing of security expenditure may activate crowding-out mechanisms that raise interest rates and reduce credit availability for private investors, potentially offsetting complementarity benefits (Dunne, Smith, & Willenbockel, 2005; Akinbobola & Saibu, 2021). Consequently, whether government security expenditure stimulates or deters private investment in Nigeria depends critically on expenditure effectiveness in delivering actual security improvements, the financing mechanisms employed, and accompanying macroeconomic conditions including inflation and interest rates that independently affect investment decisions (Yusuf & Akanbi, 2016; Adegboye, Alimi, & Olopade, 2020).

2.3 Empirical Review

Olaifa & Oluwasegun (2019) analysed the relationship between government capital expenditure and private investment in Nigeria using time series data spanning from 1981 to 2016. Co-integration regression results suggested that capital expenditure on physical assets and defense displaced private sector investment while government capital expenditure on human capital and public debt servicing promote private sector investment in Nigeria. Based on these findings, the paper recommends that government capital expenditure should be channel to human capital in order to promote private sector investment in Nigeria. Comfort, Michael & Christiana (2020) conducts a study on Government Expenditure and Private Investment in Nigeria. The study aims to look at the impact of government expenditure on the Nigerian economy and the sphere of the Nigerian private investment between the period of 1981 – 2018. Johansen co-integration approach, Error Correction

Methodology (ECM) and Granger Causality text were used for the analysis in the study. The findings show that capital expenditure had positive (crowd-in) effect on Private investment while recurrent expenditure showed a negative standing on the Nigerian private investment quota. Felix & Oluwasegun, (2020) conduct a study on Government Capital Expenditure and Private Sector Investment in Nigeria: Co-integration Regression and Toda-Yamamoto Causality Analysis. The study aims to analyzed the relationship between government capital expenditure and private investment in Nigeria. The study adopted Xu and Yan (2014) model to probe the relationship between government capital expenditure and private investment in Nigeria. The results of T-Y causality revealed the bidirectional causality between private sector investment and government capital expenditure in Nigeria Van, (2022) conducted a study on the Relationship between Public expenditure and private investment in developed and developing economies: policy implications based on the difference. The study is a universal study that aims to investigating the effect of public expenditure on private investment for a group of 36 developed countries and a group of 98 developing countries from 2002 to 2019. The study uses the FE-IV estimator and the PGM estimator to check the robustness of these estimates. The results by the two-step difference GMM Arellano-Bond estimator seem to be counterintuitive. Public expenditure countries. Ibrahim (2025) examined the relationship between capital expenditure, recurrent expenditure, total expenditure and private sector investment crowding-out effect in Nigeria. Partial least square- structural equation model (PLS-SEM) was used for measurement model and structural model. The study found that Capital expenditure has a significant positive impact on private sector investment. It was recommended that the government should prioritize infrastructure development, industrial projects, and technological advancements.

III. METHODOLOGY

3.1 Research Design

This study employs a quantitative time-series research design to examine the impact of government expenditure on security, inflation, and interest rates on private investment in Nigeria using annual data from 2000 to 2024. Following data collection, the variables will undergo descriptive statistical analysis and stationarity testing using Augmented Dickey–Fuller (ADF) test. After establishing that the variables are integrated of order I(1) and cointegrated, the study will estimate both the long-run and short-run relationships using the Dynamic Ordinary Least Squares (DOLS) technique, which corrects for endogeneity and serial correlation by incorporating leads and lags of the differenced regressors. Post-estimation diagnostics will include the variance inflation factor (VIF) test to assess multicollinearity, alongside checks for model adequacy such as residual normality, heteroskedasticity, and autocorrelation tests, ensuring robust and reliable inference on how security expenditure and macroeconomic conditions influence private investment in Nigeria.

3.2 Sources of Data

Secondary macroeconomic data will be sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin, National Bureau of Statistics (NBS), and the World Bank's World Development Indicators (WDI).

3.3 Model Specification

The study adopts a functional econometric model that links government expenditure on security and private investment. The general form of the model is specified as:

$$PI_t = f(GEXS_t, INF_t, INT_t) \ldots\ldots (1)$$

The econometric form of the model having being standardized by transforming private investment and government expenditure on security into natural logarithm to curtail the effects of spurious regression is specified as:

$$LNPI_t = \beta_o + \beta_1 LNGEXS_t + \beta_2 INF_t + \beta_3 INT_t + \mu_t \ldots\ldots (2)$$

Where:

PI = Private investment (proxied by private gross fixed capital formation)

GEXS = Government expenditure on security

INF = Inflation rate

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INT = Interest rate.

Further, the log-linear econometric specification suitable for DOLS is:

$$LNPI_t = \beta_0 + \beta_1 LNGEXS_t + \beta_2 INF_t + \beta_3 INT_t + \sum_{j=-q}^{p} \beta_j \Delta X_{t+j} + \mu_t \quad \ldots\ldots (3)$$

Where:

β_0 = intercept term

β_1, β_2, β_3 = long-run elasticities of private investment with respect to government expenditure on security, inflation, and interest rate, respectively.

ΔX_{t+j} = leads and lags of first-differenced regressors to correct for endogeneity and serial correlation.

p and q = number of leads and lags included in the DOLS correction.

μ_t = stochastic error term.

3.4 A-priori/Expected Sign

VARIABLE	EXPECTED SIGN	RATIONALE
GEXS	+/-	Positive if security spending improves safety (crowding-in), negative if recurrent-heavy spending crowds out investment
INF	-	Higher inflation increases uncertainty and reduces real returns
INT	-	Higher interest rates increase the cost of capital, reducing investment

Source: Researcher's computation (2026)

3.5 Justification of the Model

The Dynamic Ordinary Least Squares (DOLS) model is justified for this study because it provides efficient and unbiased long-run estimates in small to moderate time-series samples, even when regressors are endogenous. It corrects for simultaneous equation bias and serial correlation by including leads and lags of the first-differenced explanatory variables, which is particularly suitable given the potential interdependence between security expenditure, macroeconomic variables, and private investment.

3.6 Test of Significance

The significance was tested at 5% level of significance using the coefficients of the independent variables and following the Rule: Reject the Null hypothesis if the t-prob is less than 0.05, otherwise accept the Null hypothesis when t-prob is greater than 0.05, i.e. Reject if t-prob <0.05, Accept if t-prob > 0.05.

IV. DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Data Presentation

Table 4.1: Data for Government Expenditure on Security, Inflation, Interest Rate and Private Investment in Nigeria (2000-2024)

YEAR	PRIVATE INVESTMENT (N'Bn)	GOVT EXPENDITURE ON SECURITY (N'Bn)	INFLATION RATE (%)	INTEREST RATE (%)
2000	2,121.35	25.15	6.90	21.3
2001	3,057.32	38.85	18.90	23.4
2002	3,680.07	63.24	12.90	24.8
2003	4,295.62	68.38	14.00	20.7

2004	5,648.38	97.80	15.00	19.2
2005	7,347.45	82.00	17.90	17.9
2006	9,349.66	118.00	8.20	16.9
2007	15,374.08	181.29	5.40	16.9
2008	26,842.29	196.90	11.60	15.1
2009	32,367.67	221.65	12.50	19
2010	33,431.44	224.20	13.70	17.6
2011	28,441.66	280.00	10.80	16
2012	29,872.68	362.50	12.20	16.8
2013	34,476.63	292.70	8.50	16.7
2014	43,234.79	273.14	8.00	16.5
2015	50,635.03	410.20	9.00	16.8
2016	57,270.36	417.66	15.70	16.9
2017	59,782.41	397.95	16.50	17.6
2018	56,691.01	489.65	12.10	16.9
2019	58,408.45	668.40	11.40	15.4
2020	72,096.16	728.88	13.20	13.6
2021	87,740.41	679.96	17.00	11.5
2022	105,125.77	770.24	18.80	12.3
2023	139,707.07	825.02	29.00	18.75
2024	100,854.53	1647.82	33.2	27.5

Sources: Central Bank of Nigeria (CBN) Statistical Bulletin, National Bureau of Statistics (NBS), and the World Bank's World Development Indicators (WDI), 2025

4.1.1 Descriptive Statistics Result

Table 4.1: Descriptive Statistics for Government Expenditure on Security, Inflation, Interest Rate and Private Investment in Nigeria (2000-2024)

	LNPI	LNGEXS	INF	INT
Mean	10.139	5.509982	14.096	17.842
Median	10.41725	5.63479	12.9	16.9
Maximum	11.8473	7.407208	33.2	27.5
Minimum	7.659808	3.225043	5.4	11.5
Std. Dev.	1.22128	1.038853	6.317534	3.602478
Skewness	-0.63921	-0.43251	1.473162	0.842585
Kurtosis	2.18536	2.543502	5.361625	3.920439
Jarque-Bera	2.393734	0.996519	14.85218	3.840629
Probability	0.302139	0.607587	0.000596	0.146561
Sum	253.4751	137.7495	352.4	446.05
Sum Sq. Dev.	35.7966	25.90116	957.8696	311.4684
Observations	25	25	25	25

Source: Researcher's computation (2026)

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The descriptive statistics for the study variables indicate that LNPI (log of private investment) and LNGEXS (log of government expenditure on security) are fairly stable and approximately normally distributed, with means of 10.14 and 5.51, standard deviations of 1.22 and 1.04, and slight negative skewness, suggesting that most observations cluster around the mean. In contrast, INF (inflation) and INT (interest rate) exhibit higher variability and positive skewness, with INF particularly showing leptokurtosis and non-normality, reflecting occasional extreme inflation spikes, while INT is close to normal. The ranges show substantial variation in inflation (5.4–33.2) and interest rates (11.5–27.5) compared to private investment and security expenditure, highlighting macroeconomic volatility during 2000–2024. Overall, the data suggest that private investment and security expenditure are relatively stable, whereas inflation and interest rates are more volatile, warranting careful modeling and control for macroeconomic shocks in the DOLS estimation.

4.2 Data Analysis

4.2.1 Unit Root Test Result

The Augmented Dickey Fuller (ADF) unit root test is summarized in the Table 4.3 below. This test was carried out on each of the variables at 5% critical value.

Table 4.2: Summary of the Unit Root Test Result

	ADF Test statistics			
Variable	At Level	1st Difference	Decision	Order of Integration
LNPI	-2.692201	-4.082841	Stationary at 1st difference	I(1)
LNGEXS	-1.370442	-4.506953	Stationary at 1st difference	I(1)
INF	-0.906329	-5.440690	Stationary at 1st difference	I(1)
INT	-2.727513	-5.043345	Stationary at 1st difference	I(1)
Critical Values	5%	*-2.991878*	*-2.998064*		

Source: Researcher's computation (2026)

The Augmented Dickey–Fuller (ADF) test results show that all the variables—LNPI, LNGEXS, INF, and INT—are non-stationary at level, as their test statistics (–2.692, –1.370, –0.906, and –2.728, respectively) are lower than the 5% critical value (–2.992), implying the absence of unit roots. However, each variable becomes stationary after first differencing, with ADF statistics (–4.083, –4.507, –5.441, and –5.043) all exceeding the 5% critical value at first difference (–2.998), indicating that the null hypothesis of a unit root is rejected at this stage. These results confirm that all series are integrated of order one, I(1), making them suitable candidates for cointegration analysis and justifying the application of the DOLS technique, which is appropriate for estimating long-run relationships among I(1) variables.

4.2.2 Johansen Cointegration Test

Table 4.3: Summary of the Johansen Cointegration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.** Critical Value	Max-Eigen Statistic	0.05 Critical Value	Prob.** Critical Value

None *	0.747996	61.88664	47.85613	0.0014	31.70114	27.58434	0.0139
At most 1 *	0.545592	30.18550	29.79707	0.0451	18.14147	21.13162	0.1246
At most 2	0.404923	12.04403	15.49471	0.1548	11.93850	14.26460	0.1130
At most 3	0.004578	0.105531	3.841465	0.7453	0.105531	3.841465	0.7453

Source: Researcher's computation (2026)

The Johansen cointegration test indicates the presence of a long-run equilibrium relationship among the variables—LNPI, LNGEXS, INF, and INT. The Trace test reveals two significant cointegrating equations at the 5% level, as the statistics for None (61.89 > 47.86, p = 0.0014) and At most 1 (30.19 > 29.80, p = 0.0451) exceed their critical values, while the remaining hypotheses are not significant. However, the Max-Eigen test confirms only one cointegrating vector, with significance detected at the None level (31.70 > 27.58, p = 0.0139) but not at the subsequent levels. Considering the robustness of the Trace test in small samples, the results collectively suggest at least one valid cointegrating relationship, supporting the existence of a stable long-run association between private investment, government expenditure on security, inflation, and interest rates in Nigeria. This finding further justifies the use of the Dynamic Ordinary Least Squares (DOLS) model to estimate the long-run coefficients.

4.3 Estimation of the DOLS Model

This section presents and discusses the Dynamic Ordinary Least Squares (DOLS) estimation results examining the long-run relationships between government expenditure on security, inflation, interest rates, and private investment in Nigeria over the period 2000-2024. The DOLS methodology, developed by Stock and Watson (1993), provides efficient and unbiased estimates of long-run cointegrating relationships by incorporating leads and lags of the first differences of regressors to correct for potential endogeneity and serial correlation problems inherent in standard OLS estimation of cointegrated systems.

Table 4.4: DOLS Estimation Results for Government Expenditure On Security, Inflation, Interest Rate And Private Investment In Nigeria (2000-2024)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGEXS	1.018613	0.086752	11.74164	0.0000
INF	-0.042665	0.013245	-3.221156	0.0105
INT	-0.053929	0.029236	-1.844650	0.0982
C	6.134296	0.881804	6.956531	0.0001

Source: Researcher's computation (2026)

4.3.1 Interpretation of the DOLS Results and Discussion of Findings

Government Expenditure on Security and Private Investment

The DOLS results reveal a positive and statistically significant relationship between government expenditure on security (LNGEXS) and private investment (LNPI) in Nigeria. The coefficient of 1.019 indicates that a 1% increase in government expenditure on security is associated with approximately 1.02% increase in private investment in the long run. This relationship is statistically significant at the 5% level (t-statistic = 11.742; p-value = 0.0000), providing strong empirical support for the complementarity hypothesis derived from public goods theory. This finding aligns with theoretical predictions that effective security provision creates an enabling environment for private investment by protecting property rights, enabling contract enforcement, and lowering risk premiums demanded by investors (Samuelson, 1954; North, 1990; Besley & Persson, 2011). The result suggests that government security expenditure in Nigeria has functioned as a complementary input to private investment rather than crowding it out through financial market mechanisms,

consistent with Collier and Hoeffler's (2004) argument that security provision addressing binding constraints generates positive externalities exceeding crowding-out costs.

Inflation and Private Investment

The coefficient on inflation (INF) is negative (-0.043) and statistically significant at the 5% level (t-statistic = -3.221; p-value = 0.0105), indicating that a one percentage point increase in inflation is associated with approximately 0.043% decrease in private investment in the long run. This negative relationship aligns with Fischer's (1993) demonstration that high inflation creates uncertainty about future prices and revenues that complicates investment evaluation and increases required risk premiums. The finding is consistent with Ndoricimpa's (2017) identification of threshold effects whereby inflation above certain levels significantly reduces investment in African economies. With Nigeria's average inflation rate of 14.1% during the study period substantially exceeding typical threshold estimates of 8-10%, the negative coefficient reflects the deterrent effects of persistently elevated price instability on private capital formation (Iya, Gabdo, & Aminu, 2014; Bawa, Abdullahi, & Ibrahim, 2016). From a public goods perspective, inflation may also erode security expenditure effectiveness by reducing the real value of nominal budget allocations, potentially weakening the complementarity effect between security provision and private investment.

Interest Rates and Private Investment

The coefficient on interest rates (INT) is negative (-0.054) and statistically insignificant at the 5% level (t-statistic = -1.845; p-value = 0.0982), indicating that a one percentage point increase in interest rates is associated with approximately 0.054% decrease in private investment. This confirms neoclassical investment theory predictions that higher interest rates reduce the present value of future returns, making fewer investment projects economically viable (Jorgenson, 1963; Hall & Jorgenson, 1967). The relatively modest magnitude may reflect that in developing countries with limited formal credit access, retained earnings rather than bank borrowing serve as the primary investment financing source for many firms, reducing aggregate investment sensitivity to interest rate changes (Fowowe, 2011). However, for larger firms and foreign investors accessing formal credit markets, interest rates remain highly relevant to investment decisions (Obadeyi, 2014). The negative coefficient also suggests that financing mechanisms for government expenditure matter for net investment effects, as government borrowing that raises interest rates creates headwinds partially offsetting benefits from improved security provision (Barro, 1990).

Policy Implications

The DOLS results collectively support an interpretation consistent with public goods theory while highlighting the importance of macroeconomic stability. Government security expenditure generates positive effects on private investment, confirming that security provision functions as a complementary public good creating enabling conditions for capital formation. However, high inflation and elevated interest rates independently deter investment, suggesting that full benefits of security provision require a stable macroeconomic environment. Thi

4.4 Post-estimation Diagnostics

The post-estimation diagnostics confirm that the DOLS model is statistically robust and well-specified. The centered Variance Inflation Factors (VIFs) for LNGEXS (3.93), INF (1.40), and INT (3.56) are all below the conventional threshold of 10, indicating no multicollinearity problem among the regressors. The Breusch–Godfrey LM test shows no evidence of serial correlation ($p = 0.1795$ and 0.1151), while the Breusch–Pagan–Godfrey test also indicates homoskedastic residuals ($p = 0.8870$), validating the model's efficiency. The Ramsey RESET test ($p = 0.4060$) confirms no omitted-variable bias and supports the functional correctness of the model. The normality test (Jarque–Bera $p = 0.4711$) shows that the residuals are normally distributed, satisfying one of the key classical assumptions. Additionally, the CUSUM and CUSUM-Q plots lie within the 5% significance bounds, confirming structural stability of the long-run model across the sample period. Overall, these diagnostics show that the estimated DOLS model is reliable, stable, and appropriate for policy inference.

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V. SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

The study examined the long-run impact of government expenditure on security, inflation, and interest rates on private investment in Nigeria using annual data from 2000–2024 and estimated through the Dynamic Ordinary Least Squares (DOLS) technique. Results show that government expenditure on security has a positive and highly significant effect on private investment, indicating that improved security conditions enhance investor confidence and stimulate capital formation. Inflation exerts a negative and significant influence, suggesting that rising price levels erode real returns and create uncertainty that discourages investment decisions. Interest rates also have a negative but weakly insignificant effect on private investment, implying that high borrowing costs may constrain investment, although the impact is less robust statistically. Diagnostic tests - including VIF, Breusch-Godfrey, Breusch-Pagan, RESET, normality, and CUSUM plots - confirm no multicollinearity, no serial correlation, homoskedasticity, correct specification, normal distribution of residuals, and model stability, affirming the reliability of the results.

5.2 Conclusion

The study concludes that private investment in Nigeria is significantly shaped by security-related government spending and macroeconomic conditions. Increased expenditure on security plays a crucial role in boosting investor confidence by reducing crime risks and improving the overall business climate. Conversely, inflation and high interest rates undermine private investment by heightening uncertainty, reducing purchasing power, and increasing the cost of capital. The presence of a valid long-run cointegrating relationship indicates that these variables interact persistently over time, making their management essential for sustaining private-sector-led growth. Overall, the findings reveal that strengthening security institutions while maintaining macroeconomic stability is critical for fostering a conducive investment environment in Nigeria.

5.3 Recommendations

The following recommendations are proposed in line with the findings of this study.

- Government should maintain security expenditure while improving effectiveness to maximize security improvements per naira spent.
- Inflation control should complement security provision, with the Central Bank of Nigeria pursuing credible monetary policies anchoring inflation expectations.
- Efforts to reduce interest rates through financial sector development would lower investment costs and strengthen private capital formation.
- The complementary nature of security provision and macroeconomic stability implies that coordinated policy approaches yield superior outcomes, recognizing that security reforms, monetary policy improvements, and fiscal consolidation each reinforce the effectiveness of the others in promoting private.

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